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| 09/719,323 | 01/04/2001 | Toshikazu Ura | F-6768 | 7228 |

7590 01/03/2003
Jordan and Hamburg
122 East 42nd Street
New York, NY 10168

EXAMINER

TSANG FOSTER, SUSY N

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1745

DATE MAILED: 01/03/2003 //

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/719,323

Applicant(s)

URA, TOSHIKAZU

Examiner

Susy N Tsang-Foster

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office Action is responsive to the amendment filed on 10/15/2002. Claim 5-14 have been added. Claims 1-14 are pending. Claims 1-14 are finally rejected for reasons below.

Priority

2. The English translation of the foreign priority document filed on 10/15/2002 has overcome the previous art rejections of record for claims 1-4 based on JP 2000-058038.

It is noted that on page 16 of the English translation filed on 10/15/2002 of the foreign priority document JP 11-100750 filed on 8 April 1999, mentions “projections of current collecting elements 1b, 2b so that they are bent by about 90° radially inwards as shown by the imaginary lines” [emphasis added]. Page 14, lines 18-22 of applicant’s specification of the instant application mentions “the projected portions of the current collectors 1b, 2b are elastically deformed to be bent radially inwards substantially at 90° as shown by the phantom lines, whereby flat planes 11, 12 are formed at opposite ends of the electrode plate group”. In view of the translation of the priority document, the Examiner is interpreting “bending substantially at 90° ” to be equivalent to “bending at about 90°”. In the amendment filed on 10/15/2002, applicant added the limitation “bending at a 90° angle to form a flat plane” in newly added claims 5-14. The Examiner is interpreting “substantially at 90° ” in applicant’s specification to encompass “bending at a 90° angle”. Furthermore, applicant did not specifically mention “bending at a 90° angle” in the original disclosure.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 5-14 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically in claims 5 and 10, the limitations “a first electrode material adjacent the at least one first current collector”, and “a second electrode material adjacent the at least one second current collector” are not in the original disclosure.

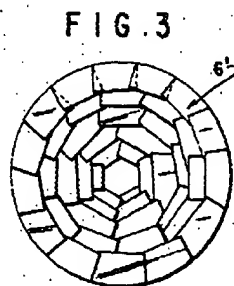
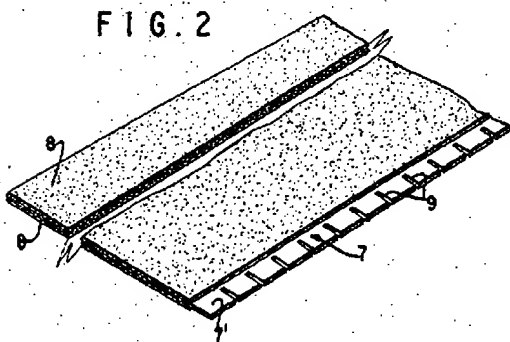
Instead, the original disclosure supports the following limitations: “a first electrode material adjacent a first current collector” (see page 6, lines 1-10 of the specification), “a second electrode material adjacent a second current collector” (see page 6, lines 1-10 of the specification).

In claims 9 and 14, the limitation “a top edge of the at least one first current collector forms a continuous spiral edge bent orthogonally with respect to the axis of the spiral” is not in the original disclosure. The original disclosure does not show a continuous spiral edge bent orthogonally with respect to the axis of the spiral because there is no top view or bottom view of the electrode plate group in the Figures or any mention in the specification that a top edge of either the first current collector or the second current collector forms a continuous spiral edge

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bent orthogonally with respect to the axis of the spiral. The method depicted in Figure 2 does not ensure a top edge of the first current collector that forms a continuous spiral edge bent orthogonally with respect to the axis of the spiral. As admitted by the applicant on page 15, lines 1-5 of the specification, folding may occur to some extent using the method depicted in Figure 2. Since there is no mention of slits being made at the edge of the current collector, the folding of the edge of the current collector into a plane will not result in a continuous spiral edge with a perfectly flat plane of 90° . Furthermore, folding of the edge onto itself may result in a discontinuous spiral edge. The edge of the current collector must be slit in order to form a continuous spiral edge with a flat plane of 90° as disclosed by Jean-Pierre Cailley in Figures 2 and 3 and reproduced below (US 3,761,314).

Sept. 25, 1973 JEAN-PIERRE CAILLEY 3,761,314
HIGH DISCHARGE RATE ELECTRIC CELLS AND BATTERIES
Filed June 22, 1971 3 Sheets-Sheet 1



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Claims depending from claims rejected under 35 USC 112, first paragraph are also rejected for the same.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3, 5-7, 10, and 11 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Oweis et al. (USP 5,972,532).

See abstract, Figures 1-3 and 5; col. 1, lines 10-35; col. 2, lines 5-50; col. 3, lines 15-27; col. 3, line 65 to col. 4, line 40; col. 5, lines 45-67; and col. 6, lines 13-17 of the reference.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 4, 8, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oweis et al. (USP 5,972,532) in view of JP 7-014569.

The product-by-process limitations of claim 4 are not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (see In re Thorpe, 227 USPQ 964, (CAFC 1985), In re Brown, 173 USPQ 685 (CCPA 1972), and In re Marosi, 218 USPQ 289, 292-293 (CAFC 1983)).

Thus, product-by-process limitation “the flat planes being formed by pressing said ribs against the portions of the current collectors” is not given patentable weight in claim 4.

Oweis et al. disclose all the limitations of claim 4 (see paragraph 6 above) except that the current collecting plate is formed with a plurality of ribs thereon such as to protrude towards the projected portions of the current collectors and the current collecting plate is welded to each of the current collectors at the ribs.

JP 7-14569 teaches a current collecting plate having slit holes 13 and eight radially symmetrical comb teeth (ribs) that protrude from one side of the current collector (see abstract and Figures 2-5) and that the use of the current collecting plate having the eight comb teeth (ribs) protruding toward the projected portions of the current collectors of an electrode plate group of a battery enables improvement of welding efficiency due to uniform welding current flow and a firm weld state is obtained between the current collecting plate and the current collectors (see abstract, Figures 2-5, and example paragraph of machine translation provided for the reference).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the current collecting plate of JP 7-14569 having slit holes 13 and eight radially symmetrical comb teeth (ribs) that protrude from one side of the current collecting plate toward the projected portions of the current collectors of an electrode plate group because the structure

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of the current collecting plate enables a more uniform current flow during welding and a firm weld can be obtained between the current collecting plate and the projected portions of the current collectors of an electrode plate group.

9. Claims 5-7, 9, 10, 11, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuda et al. (US 4,332,867) in view of Jean-Pierre Cailley (US 3,761,314).

The product-by-process limitation of claim 7 is not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (see In re Thorpe, 227 USPQ 964, (CAFC 1985), In re Brown, 173 USPQ 685 (CCPA 1972), and In re Marosi, 218 USPQ 289, 292-293 (CAFC 1983)). Hence the limitation "laser-welded" in claim 7 is not given patentable weight.

Tsuda et al. disclose a nickel-cadmium cell (which is inherently rechargeable) comprising (col. 1, lines 1-9) an electrode plate group which comprises a first current collector (positive plate) and a first electrode material adjacent the first current collector; a second current collector (negative plate), and a second electrode material adjacent the second current collector; an intervening separator for separating the first current collector and the first electrode material from the second current collector and the second electrode material; an electrolyte; a battery container for accommodating the electrode plate group and the electrolyte (col. 1, lines 1-9; col. 3, line 6 to col. 4, line 64 and Figures 1-5).

The separator is disposed between the positive and negative current collectors to form a spiral wound assembly and the positive and negative current collectors are offset from each other and also from the separator to leave respective edge portions of the positive and negative current

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collectors and one on each end of the spiral (coil) assembly and edge portions of the respective positive and negative current collectors are kept free of active material (col. 1, lines 49-60).

Positive and negative collector plates are welded to the respective edge portions of the positive and negative current collectors (col. 4, lines 61-64). The positive and negative collector plates are welded in the radial direction at a plurality of locations in the circumferential direction with respect to the plane of the ends of the spiral assembly (see Figures 2-4 and col. 5, lines 3-46).

Tsuda et al. do not disclose that edge portions of the positive current collector and the negative current collector are bent at a 90° angle to form a flat plane at both ends of the electrode plate group, and that a top edge of the first current collector forms a continuous spiral edge bent orthogonally with respect to the axis of the spiral.

Jean-Pierre Cailley teaches slitting and bending edge portions of the positive current collector and negative current collector that are free of active material at a 90° angle to form respective continuous spiral edge flat plane bent orthogonally with respect to the spiral at both ends of the electrode plate group that are welded to first and second collector plates and effective contact results between the collector plates and the respective flat plane of the current collector due to the reliable welds that can be made between two relatively large contacting areas capable of bearing high pressures during welding (col. 1, lines 13-34; col. 2, lines 7-15 and lines 32-45; col. 3, lines 5-37 and lines 65-75; col. 4, lines 15-35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to slit and bend edge portions of the positive current collector and negative current collector at a 90° angle to form respective continuous spiral edge flat plane bent orthogonally with respect to the spiral at both ends of the electrode plate group that are welded to first and

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second collector plates because effective contact results between the collector plate and the corresponding flat plane of the current collector due to the reliable welds that can be made between two relatively large contacting areas capable of bearing high pressures during welding.

10. Claims 12 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuda et al. (US 4,332,867) in view of Jean-Pierre Cailley (US 3,761,314) as applied to claim 11 above, and further in view of WO 97/30487 (equivalent document US 6,371,995 B1 relied upon for translation).

Tsuda et al. (US 4,332,867) in combination with Jean-Pierre Cailley (US 3,761,314) teaches all the limitations of claim 11 (see above) except laser welding the first and second current collectors to the respective flat planes.

~~WO 97/30487 teaches that welding of a lead plate in a battery can be accomplished by~~
~~any well known method such as D.C. or A.C. electric welding, laser welding, and ultrasonic~~
welding (col. 18, lines 5-11).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use laser welding instead of A.C. electric welding to weld the collector plate to the respective current collectors in the battery of Tsuda et al. because using laser welding is equivalent to A.C. electric welding for the purposes of achieving a weld between the collector plate and current collector and because laser welding allows for accurate alignment of the beam to the target during welding that results in efficient welding.

Response to Arguments

11. Applicant's arguments filed 10/15/2002 have been fully considered but they are not persuasive.

Applicant asserts that the Oweis et al. reference fails to teach a current collector forming a flat plane wherein the flat plane is joined to a current collecting plate and that rather the reference discloses a folded portion 12 that does not form a flat plane with tab 8 and contacts tab 8 at an angle as shown in Figure 3.

In response, Figure 3 of Oweis et al. is just one embodiment of several embodiments disclosed in the reference. Oweis et al. also disclose that in Figure 2, 18 is a flat plane that is joined to the tab 8 and that plane 18 is substantially perpendicular to the longitudinal axis of the cell but can be formed at any angle thereto (col. 5, lines 45-58). The term "substantially perpendicular" is identical to the term "substantially at 90°" because mathematically, a perpendicular angle is 90°. It is noted that applicant discloses in the specification that the angle of the folded portion is substantially at 90° to form flat planes 11 and 12 (see page 14, lines 18-22 of the specification). Therefore, as disclosed by applicant, the angle of the flat plane is substantially at 90° which is identical to the substantially perpendicular flat plane 18 as disclosed by Oweis et al. The term "substantially perpendicular" also encompasses a 90° angle.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang-Foster, Ph.D. whose telephone number is (703) 305-0588. The examiner can normally be reached on Monday through Thursday from 9:30 AM to 8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at (703) 308-2383. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900.

The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9310 for regular communications and (703) 872-9311 for After-Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

st/29 December 2002


Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700